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EXAMINER

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SURYA PRAKASH, SEKHARIPURAM R. NARAYANAN,
ANTHONY ATTI, GEORGE OLAH, and MARSHALL C. SMART

Appeal 2009-000459
Application 09/489,515
Technology Center 1700

Decided: December 31, 2009

Before ALLEN R. MACDONALD, *Vice Chief Administrative Patent Judge*,
JEFFREY T. SMITH, and LINDA M. GAUDETTE,
Administrative Patent Judges.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Statement of the Case

This is an appeal under 35 U.S.C. § 134 from a final rejection of claims 19-22, 24-27, and 29-33. We have jurisdiction under 35 U.S.C. § 6.¹

¹ In rendering this decision we have considered the Appellants' arguments presented in the Appeal Brief dated November 13, 2006.

Appellants' invention relates to a fuel cell comprising a membrane electrode assembly(MEA) and a process for making a membrane electrode assembly (MEA) comprising applying a catalyst ink to at least one side of a polystyrene sulfonic acid and poly(vinylidene difluoride) membrane (PSSA-PVDF membrane). (Spec. 1). Claims 19 and 26 are illustrative:

19. A process for making a membrane electrode assembly for a fuel cell, comprising:

- (a) providing a catalyst ink comprising a catalytic material, and poly(vinylidene fluoride), adding to the catalyst ink a second ionomer comprising a liquid copolymer of tetrafluoroethylene and perfluorovinylethersulfonic acid;
- (b) applying the catalyst ink to at least one side of a PSSA-PVDF membrane; and
- (c) bonding the membrane to at least one electrode.

26. A fuel cell comprising a membrane electrode assembly, wherein the membrane electrode assembly is made by the process of:

- (a) providing a catalyst ink comprising a catalytic material, and poly(vinylidene fluoride), adding to the catalyst ink a second ionomer comprising a liquid copolymer of tetrafluoroethylene and perfluorovinylethersulfonic acid;
- (b) applying the catalyst ink to at least one side of a PSSA-PVDF membrane; and
- (c) bonding the membrane to at least one electrode.

The Examiner cited the following references in rejecting the appealed subject matter:

Lawrance	4,272,353	Jun. 9, 1981
Fleisher	5,643,689	Jul. 1, 1997
Cabasso	5,783,325	Jul. 21, 1998
Grot	5,919,583	Jul. 6, 1999

Kindler	5,992,008	Nov. 30, 1999
Prakash	6,444,343 B1	Sep. 3, 2002

The Examiner rejected the claims on appeal as follows:

Claim 26 stands rejected under 35 U.S.C. § 102(e) as anticipated by or under 35 U.S.C. § 103(a) as obvious over Prakash.

Claims 19, 20, 25-27, 32, and 33 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Grot, Fleischer, and Kindler.

Claims 21, 22, 29, and 30 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Grot, Fleischer, Kindler, and Cabasso.

Claims 24 and 31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Grot, Fleischer, Kindler, and Lawrance.

*Rejection of claim 26 under 35 U.S.C. § 102(e)
as anticipated by or, in the alternative, under 35 U.S.C. § 103(a)
as unpatentable over Prakash*

The Examiner found that Prakash describes every limitation of the invention recited in the appealed claim 26. (Ans. 4, 5 and 9). Appellants, on the other hand, contend that “[a]lthough Prakash teaches a fuel cell comprising a catalyzed membrane electrode assembly with a PSSA/PVDF membrane, the catalyst ink present in said membrane electrode assembly does not include PVDF” (App. Br. 6).

Thus, the question presented is: Have Appellants demonstrated error in the Examiner’s finding that Prakash discloses, either explicitly or inherently, a fuel cell comprising a catalyzed membrane electrode assembly with a PSSA/PVDF membrane as recited in claim 26?

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner’s position. *See In re Kahn*, 441 F.3d 977, 985-86

(Fed. Cir. 2006). Therefore, we look to Appellants' Brief to show error in the proffered rejection. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2007).

The patentability of a product does not depend on its method of production. If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

In re Thorpe, 777 F.2d 695, 697 (Fed. Cir. 1985) (citations omitted).

Appellants' arguments are directed to differences in Prakash's and Appellants' methods of making a PSSA/PVDF membrane. (App. Br. 4-7). Appellants argue that a PSSA/PVDF membrane having a catalyst ink that does not contain PVDF compared to a PSSA/PVDF membrane having a catalyst ink that contains PVDF is not insubstantial. (App. Br. 7). However, Appellants have not directed us to evidence to establish the argued distinction. The claims are drafted in product-by-process format and, therefore, to overcome the Examiner's rejection, Appellants must establish that a fuel cell comprising a PSSA/PVDF membrane resulting from the process steps recited in claim 26 differs from the fuel cell comprising a PSSA/PVDF membrane formed by Prakash's method. Appellants have only argued that such a distinction exists.

Accordingly, we sustain the rejections of claim 26 under 35 U.S.C. § 102(e) as anticipated by Prakash and under 35 U.S.C. § 103(a) as unpatentable over Prakash.

*Rejections under 35 U.S.C. § 103(a) of claims 19-22, 24, 25, 27,
and 29-33 over Grot, Fleischer, and Kindler*

ISSUE

The issue on appeal is: Have Appellants shown that the Examiner reversibly erred in determining that it would have been obvious to combine a PVDF with PSSA to make a PSSA-PVDF membrane?

FINDINGS OF FACT

The Examiner found that Grot describes a process for making a membrane electrode assembly (MEA) comprising applying a Pt catalyst ink to at least one side of a membrane made from similar materials as the ink. The Examiner found that Fleischer would motivate a person of ordinary skill in the art to combine a PVDF with PSSA to make a PSSA-PVDF membrane because Grot discloses the binder polymer having cation exchange groups preferably is the same polymer as in the membrane. (Ans. 5-6; Grot, col. 8 ll. 41-43). The Examiner found that Kindler teaches a catalyst ink comprising NAFION[®] (a co-polymer of tetrafluoroethylene and perfluorovinylether sulfonic acid). The Examiner concluded that it would have been obvious to a person of ordinary skill in the art to employ a liquid copolymer such as NAFION[®] in the MEA of Grot to enhance ionic conduction and improve wetting properties within the electrode. (Ans. 6-7).

PRINCIPLES OF LAW

A claimed invention is unpatentable if the differences between it and the prior art “are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

skill in the art.” 35 U.S.C. § 103. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

ANALYSIS

Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2009). Appellants have not specifically addressed the individual claims. Appellants’ discussions regarding the separately rejected claims 21, 22, 24, and 29-31, rely on the arguments presented for independent claim 19. Consequently, we will limit our discussion to independent claim 19.

Appellants contend “the proposed combination of Grot et al. and Fleisher et al. is insufficient to render the claimed subject matter *prima facie* obvious. Grot teaches the use of a membrane having interstices filled with an inorganic filler in an organic fuel cell. According to the principle of operation of Grot, an inorganic filler is required to fill the interstices of a polymer membrane to slow or block organic fuels such as methanol from diffusing through a membrane.” (App. Br. 10).

Appellants’ arguments are not persuasive of error in the Examiner’s rejection. Appellants have failed to explain why a PSSA-PVDF membrane would have been unsuitable for use with inorganic filler. Moreover, the claimed invention does not exclude their use of an inorganic filler.

Appellants' argument regarding the purported swelling of the PSSA-PVDF membrane (App. Br. 9) is not persuasive for the reasons set forth by the Examiner (Ans. 12-13). Moreover, Appellants arguments are based on a comparison to properties described in the present specification and are not characteristics identified by Grot as being relevant to the selection of proper MEA materials.

Under these circumstance, we cannot conclude that the Appellants have established an error in the Examiner's determination that the appealed subject matter is obvious under 35 U.S.C. § 103. Therefore, the rejections of claims 19-22, 24-27, and 29-33 under § 103 is affirmed.

ORDER

All of the appealed rejections of claims 19-22, 24-27, and 29-33 are affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

tc

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